

crutch  
USA



# Amplifiers

BMF2125 / BMF2200 / BMF2250 / BMF4100  
Owners / Installation Manual

## **Congratulations on your purchase of quality Crunch car audio gear!**

Years of testing and development have gone into each Crunch product, and you can rest assured that you've purchased the best. Your precision engineered Crunch components will perform best when installed by experienced installers. Therefore, we highly recommend that you contact your authorized Crunch dealer to help customize and install your system. Crunch audio products are made to withstand years of hard use, and to consistently deliver audiophile quality sound.

### **Check out these features!**

- Gangsta High Dissipation Heat Sink distributes heat evenly and effectively
- Gangsta Design is just right for the tuner
- Bass Remote Optional
- Crunch Mosfets for clean, high speed, high performance output and Crunch reliability
- G-Force Power Supply – PWM power supply delivers reliable current on demand
- SEPP Single Ended Push Pull A/B Amplifier Operation
- Versa Cross featuring HP and LP Adjustments
- Silver RCA Inputs
- Silver RCA Outputs
- Protection Circuitry ensures your amplifier will not be damaged by current, short circuit or thermal issues
- Green "On" LED
- Red "Protect" LED
- High level inputs for OEM integration

**CAUTION:** Gangsta amplifiers are 4 Ohms and 2 Ohms stable in the STEREO mode;  
4 Ohms ONLY in the MONO bridged mode.  
DO NOT wire 2 Ohms in the MONO bridged mode.

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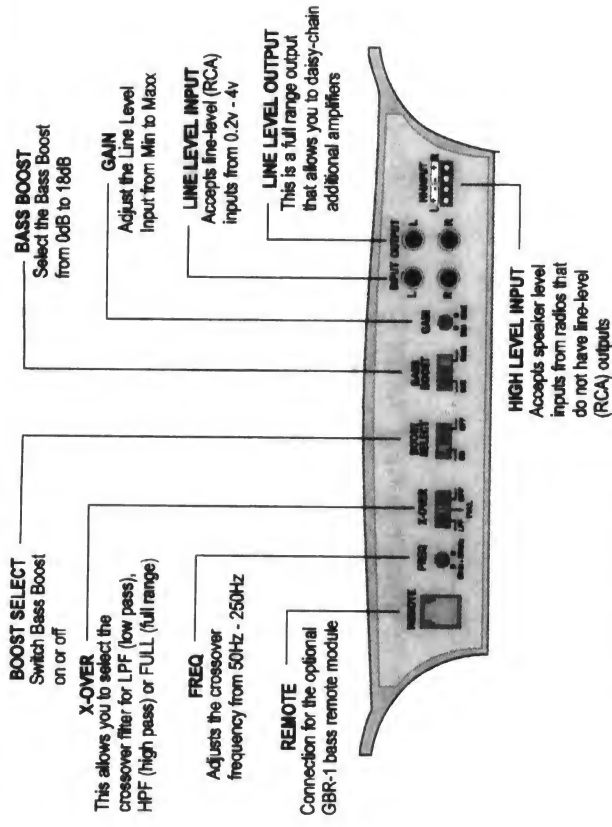
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## 2 CHANNEL AMPLIFIER FRONT PANEL FEATURES

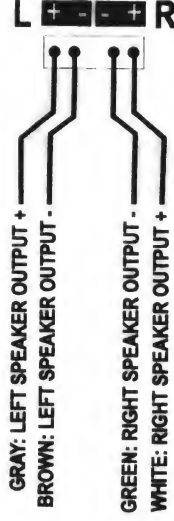
### BMF2125 / BMF2200 / BMF2250



## USING THE HIGH LEVEL INPUTS

Connect the HIGH LEVEL INPUT connector wires to the speaker level of the unit as in the diagram. Use #18 or thicker stranded, insulated speaker wire.

### HIGH LEVEL INPUT HARNESS



## **2 CHANNEL AMPLIFIER APPLICATIONS**

**BMF2125 / BMF2200 / BMF2250**

### **Basic Application**

This application describes the basic full range application for these amplifiers.

#### **Interconnect Cable Checklist:**

Connect the INPUT of the amplifier to the CD/Radio line output with good quality RCA to RCA cables. Alternatively, use the HIGH LEVEL INPUT connection shown at the bottom of page 3, if the CD / RADIO only has speaker level outputs available.

#### **Switch setting checklist:**

Set the SELECT switch to FULL

#### **Level Control checklist:**

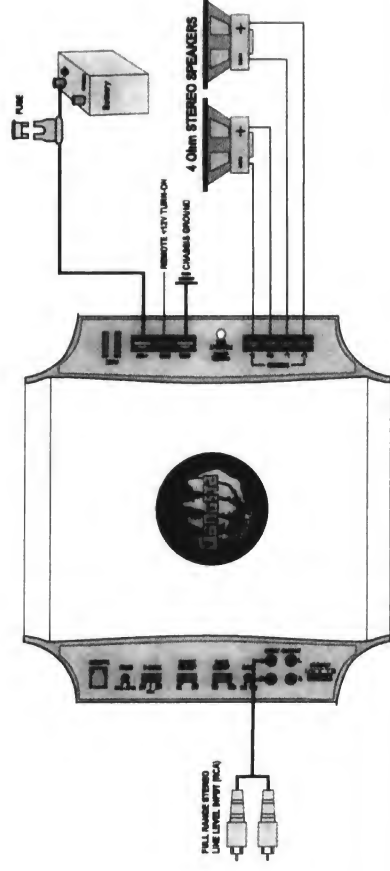
Turn the GAIN controls on the amplifier to MIN initially.

Once the initial power sequence has been performed, set the CD/RADIO volume control to roughly 80% of full. Insert a CD or tune to a radio station and slowly turn up the amplifier GAIN controls until you hear some distortion, and then it off for clean sound.

Readjust the GAIN controls after setting the CROSSOVER controls to your personal taste.

#### **Minimum final loudspeaker impedances:**

2 Ohms per channel



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## **MONO BRIDGED APPLICATION**

### **Mono bridging the bass speaker:**

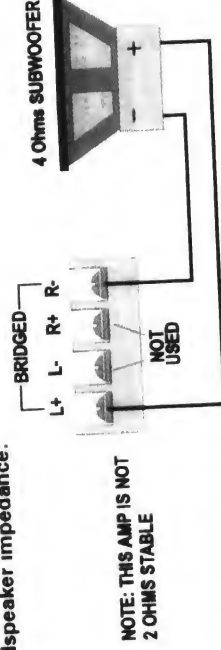
Connect the system as above, and simply wire the mono bass woofer as shown in this diagram.

### **Switch setting checklist:**

If you wish to use the built in low pass filter, set the SELECT switch to the LP position, and set the LP filter frequency as recommended by the woofer manufacturer.

### **Minimum final loudspeaker impedance:**

4 ohm mono.



## **2 CHANNEL AMPLIFIER APPLICATIONS**

### **2 Way Active, or Bi-Amplification Application with Stereo Bass**

We can use dedicated amplifiers for high and low frequencies, using the built-in crossovers. This method has the advantage in that it produces less distortion and is easier to set up than passive crossover systems.

### **Interconnect cable checklist:**

Connect the INPUTS of the HIGHS amplifier to the CD/RADIO line outputs with good quality RCA to RCA cables. Alternatively, use the HIGH LEVEL INPUT connection shown at the bottom of page 3, if the CD/RADIO only has speaker level outputs available.  
Connect the LINE OUTPUT of the HIGHS amplifier to the LINE INPUT of the BASS amplifier.

### **Switch setting checklist:**

HIGHS: Set the SELECT switch to HP (High Pass) or FULL  
BASS: Set the SELECT switch to LP (Low Pass)

### **Crossover frequency control checklist:**

HIGHS amplifier: Set the HP frequency as recommended by the loudspeaker manufacturer.  
BASS amplifier: Set the LP frequency as recommended by the loudspeaker manufacturer.

### Level control checklist:

Turn the GAIN controls on the amplifier to MIN initially. Once the initial power sequence has been performed, set the CD/RADIO volume control to roughly 80% of full.

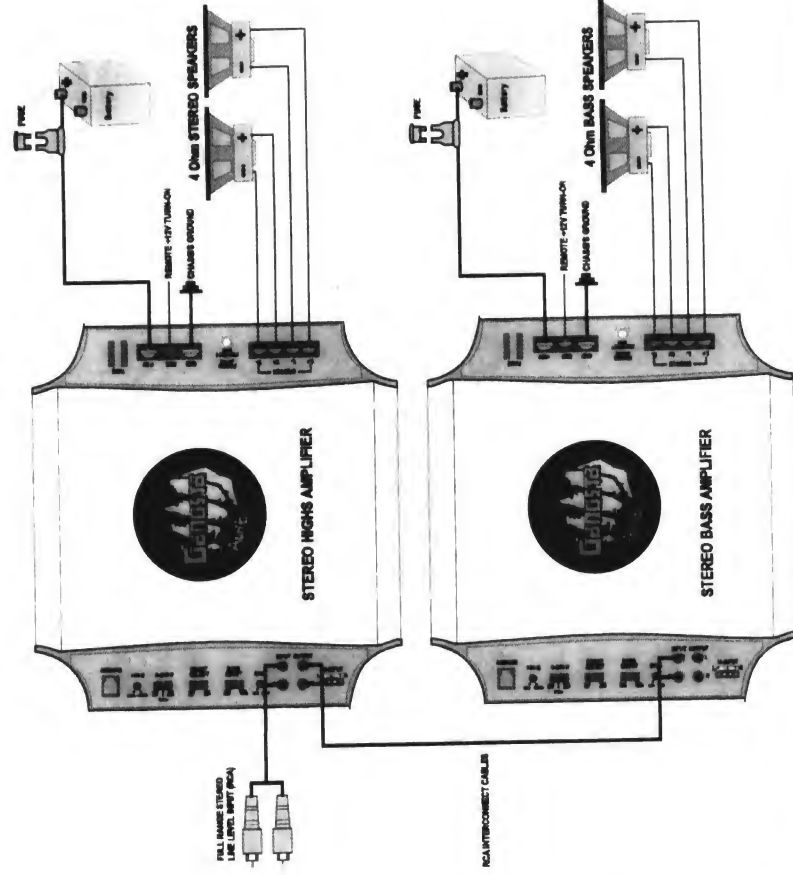
Insert a CD or tune to a radio station and slowly turn up the GAIN control on the BASS amplifier until you hear some distortion, and then back it off for clean sound.

Now set the GAIN on the HIGHS amplifier to match the highs level to the bass.

Readjust the GAIN controls after setting the BASS and TREBLE controls to your personal taste.

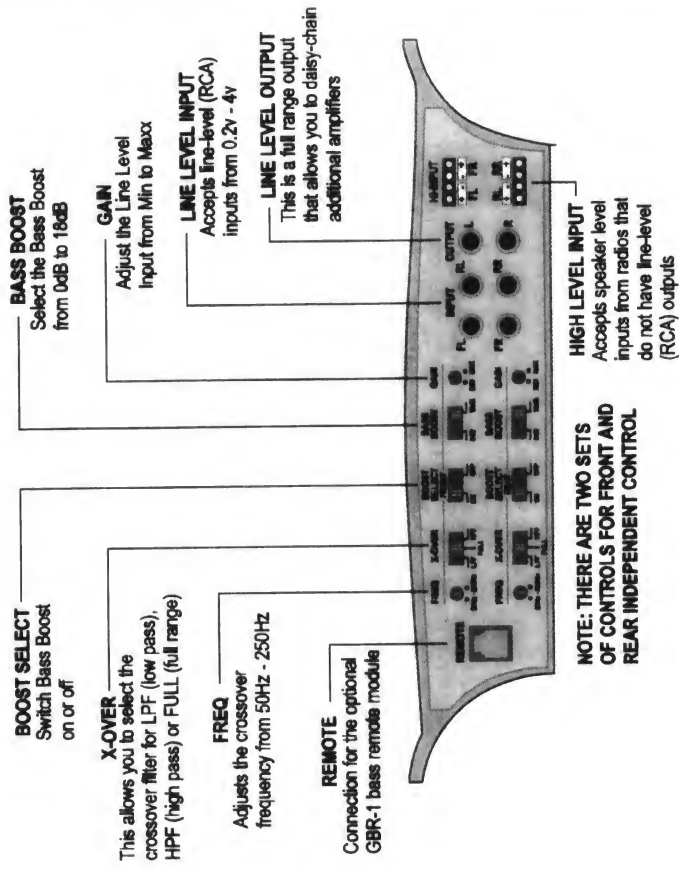
### Minimum final loudspeaker impedances:

2 ohm per channel.



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## 4 CHANNEL AMPLIFIER FRONT PANEL FEATURES BMF4100



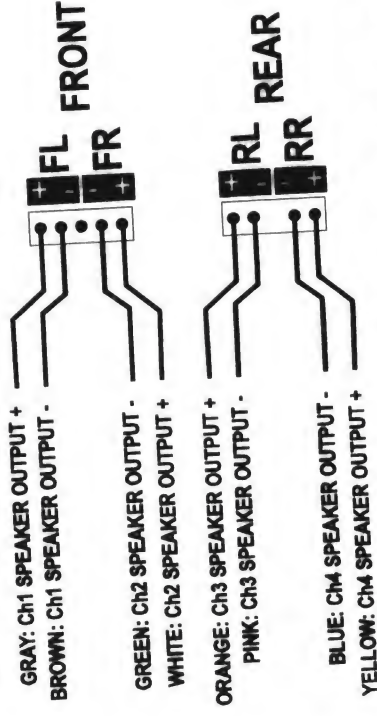
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## USING THE HIGH LEVEL INPUTS

Connect the HIGH LEVEL INPUT connector wires to the speaker level of the unit as in the diagram.  
Channels 3 and 4 use the color coding as shown.  
Use #18 or thicker stranded, insulated hookup wire.

### HIGH LEVEL INPUT HARNESS



## 4 CHANNEL AMPLIFIER APPLICATIONS

### BMF4100

### Basic Front/Rear Full Range Application

This application describes the basic front/rear full range application for these amplifiers.

#### Interconnect Cable Checklist:

Connect the INPUTS of the amplifier to the source front/rear line outputs with good quality RCA to RCA cables.  
Alternatively, use the HIGH LEVEL INPUT connection shown if the source only has speaker level outputs available.

#### Switch setting checklist:

CH1 and CH2: Select switch to FULL  
CH3 and CH4: Select switch to FULL

**Car stereo**

## Crossover frequency control checklist:

N/A

## Level Control checklist:

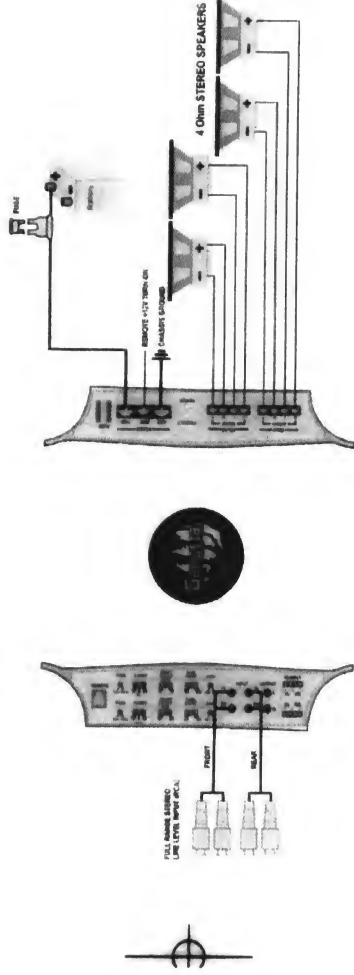
Turn the GAIN controls on the amplifier to MIN initially.

Once the initial power sequence has been performed, set the CD/RADIO volume control to roughly 80% of full. Insert a CD or tune to a radio station and slowly turn up the amplifier GAIN controls until you hear some distortion, and then back it off for clean sound.

Readjust the GAIN controls after setting the CROSSOVER controls to your personal taste.

## Minimum final loudspeaker impedances:

2 Ohms per channel





### Switch setting checklist:

CH1 and CH2: SELECT switch to HP  
CH3 and CH4: SELECT switch to LP

### Crossover frequency control checklist:

CH1 and CH2 HP: As recommended by the manufacturer of the highs speakers.

CH1 and CH2 LP: N/A

CH3 and CH4 HP: N/A

CH3 and CH4 LP: As recommended by the manufacturer of the bass speakers.

### Level control checklist:

Turn the GAIN controls on the amplifier to MIN initially.

Once the initial power sequence has been performed, set the source volume control to roughly 80% of full.

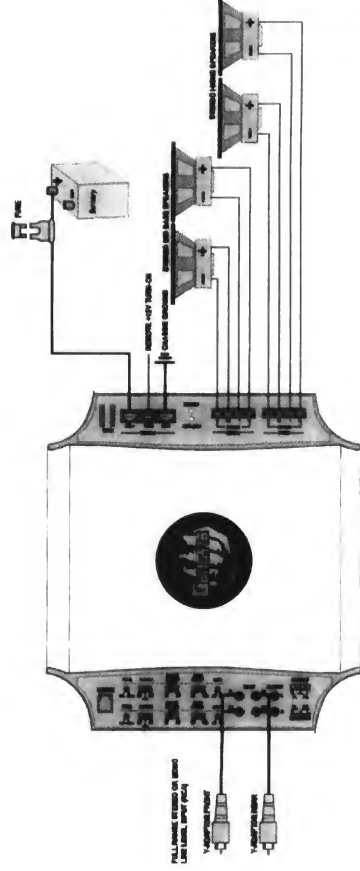
Insert a CD or tune to a radio station and slowly turn up CH3 and CH4 INPUT LEVEL controls till you hear some distortion, and then back it off for clean sound.

Now set CH1 and CH2 INPUT LEVEL control in order to match the highs level to that of the bass.

Readjust the GAIN controls after setting the CROSSOVER controls to your personal taste.

### Minimum final loudspeaker impedances:

2 ohm per channel.



## **USING MONO BRIDGING TO CREATE A 3 CHANNEL FULL RANGE AMPLIFIER**

In this section we will illustrate the versatility of the Crunch GANGSTA 4 channel amplifiers. By selectively monobridging channel pairs, these amplifiers can also be configured as 3 or 2 channel units.

### **Interconnect cable checklist:**

Connect the INPUTS of the amplifier to the CD/RADIO line outputs with good quality RCA to RCA cables.

Use a Y-adapter on Ch3 and CH4 as shown to ensure that all channels operate properly.

Alternatively, use the HIGH LEVEL INPUT connection shown on page 4, if the source only has speaker level outputs available.

### **Switch setting checklist:**

Dependent on specific application

### **Crossover frequency control checklist:**

Dependent on specific application

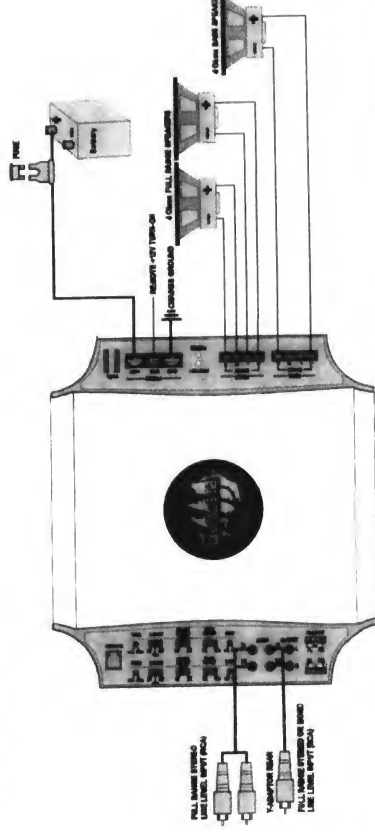
### **Level control checklist:**

Follow the instructions as described on page 4 of this manual.

### **Minimum final loudspeaker impedances:**

2 ohm per channel in stereo mode

4 ohm in mono bridged mode



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## GENERAL INSTALLATION NOTES

### System design:

The success of any car stereo system relies on several factors, such as the system design, execution of the installation and system setup. Please remember that any system is only as good as its weakest link.

Determine the system format, e.g., single amplifier, active, front/rear and so on. Then choose the amplifier power points to according to personal taste. Please remember that higher power systems are not necessarily useful purely for high sound pressure levels, but also to establish a headroom capability, to reproduce musical peaks cleanly without distortion. Lower power amplifiers will clip earlier than their more powerful cousins and cause loudspeaker failure when overdrive, due to the harmonics generated by a clipped signal, thus overheating voice coils. Choose loudspeaker and amplifier mounting locations. Loudspeaker location is always a matter of compromise between space and sound stage imaging. Amplifiers should be mounted with the fins running vertically for best convection cooling to minimize overheating. Purchase the best quality RCA cables you can afford, for reliability and less engine noise interference in the audio system.

### Installation:

#### General:

Mount the amplifier/s in the chosen location.

Run the wiring so that RCA cables are at least 18i away from power and speaker cables. Keep RCA cables away from electrical devices in the vehicle that can cause electrical noise, such as fuel pumps.

#### Power and Ground Connections:

Use a sufficient gauge power cable, at least #8 per amplifier. In a multi amplifier system, it is advisable to mount a large enough fuse right at the battery and run a master +12 volt power cable to a fused distribution block near the amplifiers. It is then a simple matter to connect the +12 volt terminal of each amplifier to the distribution block. Ground each amplifier with as short a ground lead, again at least #8 gauge, directly to the vehicle chassis. It is extremely important to keep the main ground lead from this distribution block to the chassis as short as possible, not more than 12i. The ground connection integrity to the chassis is very important, and the best way to achieve a good, solid electrical and mechanical contact is to use a large round crimp lug, crimped and soldered to the ground lug, at the connection point. Drill a clearance hole in the chassis, slightly larger than the ground lug, and use a bolt, spring washer and nut to securely fasten the ground lug. Use petroleum jelly to coat the bolt/lug connection, to prevent oxidation with time.

**TIP:** Use the same approach when installing head units, equalizers or any audio equipment for that matter - run short individual grounds from each piece directly to the vehicle chassis.

All power, ground and speaker connections should be crimped and soldered for reliability. Make sure that none of the cable insulation can chafe against exposed metal in the vehicle, causing short circuits to the chassis.

### **Safe Connection Sequence:**

After all cables are run, connect speaker wires to the speakers and amplifiers, then run and plug in RCA cables.

Next, connect all power grounds and remote turn on leads. Now connect all +12 volt cables to the amplifier/s and distribution blocks and fuse holders. Finally, connect the main +12 volt cable to the battery, with the main fuse removed, and we are almost ready to power up the system.

### **Power Up the System:**

First, make sure the head unit is off, and turn all level controls to minimum (anticlockwise), including the head unit volume control. Set all equalizers to 0 dB (no boost), and all crossover frequency controls at approximate frequencies, as recommended by the loudspeaker manufacturer. Set all input selector and crossover switches as required for the application.

Remove all amplifier fuses, and insert the main fuse at the battery. If the fuse does not blow, you can insert the fuse in one of the amplifiers, and we are ready to turn on the system.

Turn the head unit on, insert a CD, or select a radio station, and increase the head unit volume control. If the system sounds fine, turn off the head unit, and install fuses in the remaining amplifiers, one by one, till the complete systems powered up and functioning properly.

## **TROUBLESHOOTING A FAULTY SYSTEM**

The key to finding the problem in a misbehaving sound system is to isolate parts of that system in a logical fashion to track down the fault.

### **Description of the Diagnostic System built into all BlackMaxx Amplifiers**

The diagnostic system will shut down the amplifier, and turn itself back on after a short delay. If the fault is still present, the amplifier will shut off again. This state of affairs will be indicated by the rear panel power ON/DIAGNOSTIC LED color changing from green to red, under the following 2 conditions:

#### **A Short Circuit on the Loudspeaker Leads:**

Should the amplifier go into diagnostic mode, simply disconnect all RCA and speaker leads while keeping +12 volt, power ground and remote leads connected. Now turn the amplifier back on, and if the diagnostic LED changes color to red, the amplifier has an internal fault. If not, plug the RCA cables back. If it goes into diagnostic now, the fault lies in the input, either with bad cables or source unit. If the amplifier seems fine with RCA cables plugged in, connect the speakers one at a time and if one of the speakers or its wiring is faulty, it will activate the diagnostic system. Please keep in mind that if the diagnostic system is activated, it may purely be due to overheating, and not a fault condition as such.

### **Amplifier Heatsink Overheating:**

The amplifiers will shut down when the heatsink temperature reaches 176 degrees Fahrenheit, and turn back on once the unit has cooled down below that point.

### **Causes of Overheating:**

#### **Inadequate cooling:**

- 1) Relocate or remount to provide better natural airflow over the fins.
- 2) Driving high power levels into low impedances - back off on the volume control, and/or make sure you are not loading the amplifier with less than the recommended loudspeaker impedance. You can check loudspeaker impedance by measuring the voice coil DC resistance with a multimeter set to the OHMS range.

#### **Low Output Power**

- 1) Check that level controls have been set up properly.
- 2) Make sure that the battery voltage, as measured at the amplifier's +12 volt and ground terminals, is 11 volts or more. 3) Check all +12 volt and ground connections.

#### **Fuses Blowing:**

- 1) The use of loudspeaker impedances below the recommended minimums will draw more current - check.
- 2) A short on the main +12 volt cable from the battery to the vehicle chassis will cause the main fuse to blow. 3 - If an amplifier fuse blows continually, with only +12 volt, ground and remote leads connected, the amplifier may be faulty.

#### **System Does Not Turn On:**

- 1) Check all fuses.
- 2) Check all connections.
- 3) Measure the +12 volt and remote turn on voltages at the amplifier terminals. If these are non-existent or low, take voltage measurements at fuse holders, distribution blocks, the head unit's +12 volt and remote leads to localize the problem.



## Noise Problems

System noise can be divided into two categories, hiss, and electrical interference.

### Hiss, or White Noise:

- 1) High levels of white noise usually occurs when amplifier level controls are turned up too high - readjust.
- 2) Another major problem that can cause excessive hiss, is a noisy head unit - unplug the amplifier input RCA cables, and if the hiss level reduces, the source unit is at fault.

### Electrical Interference:

The inside of an automobile is a very hostile electrical environment. The multitude of electrical systems, such as the ignition system, alternator, fuel pumps, air conditioners, to mention just a few, create radiated electrical fields, as well as noise on the +12 volt supply and ground. Remember to isolate the problem - first unplug amplifier input RCA cables, if the noise is still present, check the speaker leads, if not, plug the RCA's back, and investigate the source driving the amplifier, one component at a time.

### A Ticking or Whine That Changes With Engine RPM:

- 1) This problem could be caused by radiation pickup of RCA cables too near to a fuel pump or a distributor, for instance, - relocate cables.
- 2) Check that the head unit ground is connected straight to the vehicle chassis, and does not use factory wiring for ground.
- 3) Try to supply the head unit with a clean +12 volt supply directly from the battery +, instead of using a supply from the in dash wiring/fusebox.

### A Constant Whine:

This type of noise can be more difficult to pinpoint, but is usually caused by some kind of instability, causing oscillations in the system.

- 1) Check all connections, especially for good grounds.
- 2) Make sure that no speaker leads are shorting to exposed metal on the vehicle chassis. 3 - RCA cables are notorious for their problematic nature, so check that these are good, in particular the shield connections.

Car stereo

	<b>BMF2125</b>	<b>BMF2200</b>	<b>BMF2250</b>	<b>BMF4100</b>
<b>Output Power Rating</b>	Channels/RMS/Max	Channels/RMS/Max	Channels/RMS/Max	Channels/RMS/Max
4 Ohms	2 x 75 / 100	2 x 125 / 200	2 x 150 / 250	4 x 75 / 100
2 Ohms	2 x 125 / 200	2 x 175 / 350	2 x 225 / 500	4 x 100 / 150
1 Ohm	-	-	-	-
4 Ohms Bridged	1 x 250 / 400	1 x 350 / 700	1 x 450 / 1000	2 x 200 / 300
2 Ohms Bridged	-	-	-	-
<b>Electrical Specifications</b>				
Soft Start (quiet turn-on)	YES	YES	YES	YES
Frequency Response (-3dB)	50 Hz - 250Hz	50 Hz - 250 Hz	50 Hz - 250 Hz	50 Hz - 250 Hz
Dampening Factor	200	200	200	200
Signal to Noise Ratio (A-Weighted)	> 90dB	> 90dB	> 90dB	> 90dB
THD & N	0.05%	0.05%	0.05%	0.05%
Channel Separation at 1 KHz	> 74dB	> 74dB	> 74dB	> 74dB
Variable Input Level (gain)	0.2v - 4v	0.2v - 4v	0.2v - 4v	0.2v - 4v
Power & Diagnostic LED	YES	YES	YES	YES
Audio Output (Mosfet PWM)	Bipolar	Bipolar	Bipolar	Bipolar
Crossover & Switching	HP / LP / FULL	HP / LP / FULL	HP / LP / FULL	HP / LP / FULL
Bass Boost at 45Hz	0dB - 18dB	0db - 18dB	0db - 18dB	0dB - 18dB
Subsonic	-	-	-	-
<b>Mechanical Specifications</b>				
Line Inputs Unbalanced (RCA)	YES	YES	YES	YES
Line Outputs Unbalanced (RCA)	YES	YES	YES	YES
High Level Inputs (wires)	YES	YES	YES	YES
Bass Remote Module Input	YES	YES	YES	YES
Bass Remote Module	Optional	Optional	Optional	Optional
Power / Ground Terminals	Barrier Strip	Barrier Strip	Barrier Strip	Barrier Strip
Speaker Terminals	Barrier Strip	Barrier Strip	Barrier Strip	Barrier Strip
Dimensions (L x W x H)	10 x 2.00 x 10.55	12 x 2.00 x 10.55	14 x 2.00 x 10.55	10.8x2.00 x10.55
Fuse Size	25 Amp	40 Amp	2 x 25 Amp	2 x 30 Amp

Note: All specifications subject to change with out notice.

## Maxxsonics Limited Warranty

As the manufacturer of Maxxsonics, Crunch and Hifonics car audio products, Maxxsonics USA Inc. warrants to the original consumer purchaser the speakers and subwoofers to be free from defects in material and workmanship for one (1) year from date of purchase.

To ensure your warranty policy, you must retain your original sales receipt and complete the on-line warranty registration form at [maxxsonics.com](http://maxxsonics.com) within ten (10) days of purchase.

All other parts and accessories of the system are warranted to be free from defects in materials and workmanship for for one (1) year from date of purchase. Maxxsonics will repair or replace at its option and free of charge during the warranty period, any system component that proves defective in materials and workmanship under normal installation, use and service provided that the product is returned to the authorized Maxxsonics dealer from where it was purchased. A photo copy of the original receipt and a copy of the on-line registration confirmation must accompany the product being returned. In the absence of the above, the warranty is one year from date of manufacture.

Any damage to the product as a result of misuse including blown voice coils, abuse, accident, incorrect wiring, improper installation, alteration of date code, alteration of bar code, revolution, natural disaster, unnatural disaster or any sneaky stuff because someone messed up, repair or alteration outside of our authorized service centers and anything else you may have done that you should not have done is not covered.

This warranty is limited to defective parts and specifically excludes any incidental or consequential damages connected therewith. This warranty is not to be construed as an insurance policy.

Warranty on installation labor, removal, re-installation and freight charges are not the responsibility of Maxxsonics USA Inc.

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